# MARINE BOTANY OF THE KENYA COAST
# 2. A SECOND LIST OF KENYA MARINE ALGAE

*By*

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## CYANOPHYTA

*Lyngbya majuscula* (Dillw.) Harv. Kuetz.
In her letter Dr. Koster comments: ". . . a variable species with 16–60μ thick trichomes, which are blue-green, brownish-green or greyish-violet. It is a common tropical species".

This is certainly a common species along the whole length of the Kenya coast. In places it is prominent both on account of the length of the filaments which may be 14 cms. or more and because of the abundance of such clumps as off shore at Majunguni, Pate Island where it occurred as an epiphyte on stumps and leaves of *Cymodocea ciliata.*

*Symploca hydnoides* Kuetz. ex Gom.

## CHLOROPHYCEAE

### Ulotrichales

*Enteromorpha* The identifications of species of this genus are based on Chapman (1956).
*E. compressa* (L.) Grev. Ubiquitous and sometimes common.
*E. prolifera* (Muell.) J. Ag. var. *crinita* Roth.

This species was found in dense mats in places on mud flats in Tudor Creek, Mombasa, individual plants attaining a length of 35 cms. or more.

Cells approximately square and more or less evenly arranged in longitudinal rows. Numerous small setae many of which are monosiphonous in their terminal parts.

### Cladophorales

*Cladophora fascicularis* (Mert.) Kuetz. An ubiquitous species on the Kenya coast. Very variable in length and occurring in both the elongated and the short condensed forms illustrated by Vickers (1908, Pl. 13).

### Siphonales

*Bryopsis indica* A. & E. S. Gepp. This is a distinctive species with its double series of lateral branchlets on each side of the frond axis. Only a few plants have been collected: as epiphytes on *Spyridia insignis*, on the south Kenya coast.

*Caulerpa fergusonii* Murray. The plants of this species collected on the Kenya coast agree well with the description and illustration (Fig. 3) given by Taylor for plants from Mozambique and Zanzibar. (Taylor, 1967).

The articulations of the frond axis are less well marked than might be expected from the figures given by Murray (1891, Pl. 53, Fig. 1) and by Svedelius (1906, Pl. 140, Fig. 51) for Ceylon plants and by Okamura for Japanese plants (1913–15, Vol. 3, Pl. 130). They are more in agreement with the figure given by Weber van Bosse (1898, Pl. 34, Fig. 12).

A number of depauperated specimens of this species have been collected. These may show articulation of the upright axis more clearly than specimens bearing numerous broadly clavate branchlets. This is illustrated in Fig. 1.

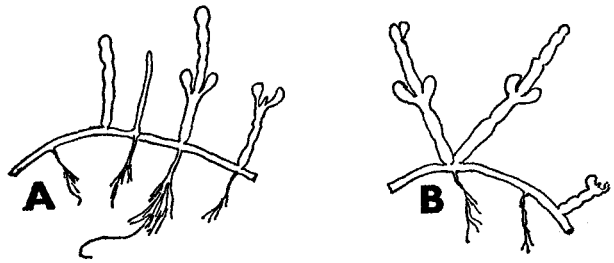


**Fig. 1.** *Caulerpa fergusonii* Murray

**A.** Turtle Bay, Isaac 2746.

**B.** Diani Beach, Isaac 2871.

*Codium vaughanii* Boergs. prox. This material is chiefly characterised by a well developed halo 2–3mm. wide of dense and continuous pale hairs.

The slimy feel of the plant, its general external morphology and dimensions and the shape of the utricles agree well with Boergesen's description and figures (Boergesen, 1940 and 1946) of the Mauritian plant which he named *C. vaughanii.* The Kenya plants, however, deviate from the Mauritian plants in the absence of terminal swellings to the hairs.

Silva (1959) notes that the Mauritian plant is closely related to *C. prostratum.* Levring & Setchell in a letter to Boergesen (1946) expressed the view that it was almost certainly *C. prostratum*, which view was later accepted by Papenfuss (1944). This view was rejected by Boergesen (1946) and from knowledge of *C. prostratum* in the field, it would seem that this plant is best regarded as a distinct species.

The Kenya plants are tentatively named *C. vaughanii.*

## PHAEOPHYTA

### Sphacelariales

*Sphacelaria furcigera* Kuetz. Forming a dense, short epiphytic growth on *Sargassum* and *Turbinaria.* Numerous well developed propagula of characteristic form.

*S. novae hollandiae* Sond. Found forming a short epiphytic fur on *Turbinaria conoides.* Many plants observed with more or less triangular propagula showing the characteristic transverse divisions of the corner cells.

## Ectocarpales

*Giffordia duchassaigniana* (Grun.) Taylor. (See Taylor, 1960.)

Illustrated under the name of *Ectocarpus indicus* Sond. by Dawson (Dawson, 1956, Fig. 32) and as *E. duchassaingianus* by Vickers (Vickers, 1908, Pt. 2, Pl. 27) and Boergesen (Boergesen 1914, Fig. 127).

The sparse irregular branching of the Kenya material agrees well with the illustrations of Dawson, Vickers and Boergesen. Dawson comments that the branching habit of this species distinguishes it from *Giffordia mitchellae* (Harv.) Hamel, the plurilocular sporangia of which species are often similar to those of *G. duchassaigniana*. *G. mitchellae* was included in the first list of Kenya marine algae (Isaac, 1967).

## Dictyotales

*Dictyopteris membranacea* (Stack) Batters. The absence of marginal spine-like teeth distinguishes this species from the otherwise similar *D. woodwardii* (Brown) J. Ag.

Cast up at Manda Kitau, Lamu District.

*D. repens* (Okamura) Boergs. In regard to range of dimensions and character of the branching this is similar to *D. delicatula* Lamour. It is by no means always easy to distinguish herbarium material of the two species. Plants were named *D. repens* if they showed areas of rhizoids arising from the mid-rib and if at least a proportion of these hairs showed clear terminal expansion into relatively large scutate discs. In places rhizoidal hairs also occur from the margins.

*Spathoglossum asperum* J. Ag.

Tetrasporic plants with sporangia scattered on both sides of the thallus.

In surface view the cells are more or less in rows and roughly rectangular to irregularly polygonal.

Fewer cells are seen in section than shown by Boergesen (1957) but the anatomical structure is similar, i.e., relatively large cells (one clear row) with a few rows of smaller medulla cells on either side and on both sides an outer bounding layer of small cells.

## Fucales

*Cystoseira myrica* (Gmel.) C. Ag. This species was included in the previous list but it is necessary to point out that two forms of the species occur on the Kenya coast—the large form bearing numerous vesicles and a small stunted form which is evesiculate. The stunted form without vesicles from Mozambique was identified as *C. myrica* by J. Feldmann and was discussed by Isaac and Chamberlain in relation to Inhaca Island (Mozambique) material. (Isaac & Chamberlain, 1958). It was also recorded by the author on the Mozambique coast at Xai-Xai. (Isaac, 1957). More recently Papenfuss and Jensen have discussed the two forms of the species (Papenfuss & Jensen, 1967).

Papenfuss and Jensen regard the two forms as geographical variants and indicate the existence of intermediate forms but noting the occurrence on Mozambique Island of both the forms with vesicles and those without. On the Kenya coast both large vesiculate forms and small evesiculate forms are to be found in the same localities but they are associated with different habitat conditions. In deep pools and in waters beyond the intertidal region the plants are large and with many bladders; but higher up the shore where the plants are periodically uncovered by the tide the plants are small, irregularly branched without vesicles and with a dense covering of spine-like appendages.

## RHODOPHYTA

### Nemalionales

*Galaxaura tenera* Kjellm. Plants of this species correspond well with the South African plant so named (Kylin, 1938, Pl. 1, Fig. 2) and with the Mauritian plant (Boergesen, 1942). The East African plants, however, are larger and more frequently of the order of size of Kjellman's original specimen from "Mombasa-Zanzibar". (see Boergesen, 1942). The species was also recorded from Inhaca, Mozambique (Isaac, 1956).

*Trichogloea requienii* (Mont) Kuetz. One specimen was collected on reef at Diani. Agrees well with Boergesen's illustrations of the species. (Boergesen, 1952, Pl. 1).

### Cryptonemiales

A. *Corallinaceae.*

*Amphiroa foliacea* Lamour.

*Amphiroa fragilissima* Lamour.

*Jania ungulata* f. *brevior* (Yendo) Dawson. Material collected agrees well with Dawson's key and figure (Dawson, 1954).

B. Non-Corallinaceae

*Carpopeltis rigida* (Harv.) Schmitz. At low intertidal levels in more or less turbulent waters.

### Gigartinales

*Catanella opuntia* (Goodenough & Woodw.) Grev.

Occurs intermingled with *Bostrychia binderi* on cliffs and overhangs at high intertidal levels—often above high water level of neap tides.

*Eucheuma chondriforme* J. Ag. Material collected at Diani shows agreement in regard to size and morphology with Boergesen, 1943, Fig. 23. As in Boergesen's material no central filaments were seen in transverse section. In one specimen examined by Boergeson the main axis was flattened and in the other it was sub-terete. The main axes of the Diani material were terete. Also perhaps the forking of the ultimate branchlets of the Diani material was less marked than suggested by Boergesen's figure.

It should be pointed out that Boergesen referred the material of this taxon to *E. chondriforme* "with much doubt".

*E. cupressoideum* Web. v-Bosse.

The plants collected approximate closely to var. *verticillata* Yamada. (Yamada, 1936, pp. 131–134).

*Gracilaria arcuata* Zan.

*G. corticata* J. Ag. This species can be distinguished by its regularly dichotomous and fastigiate thallus which is of a firm, cartilaginous consistency. It is typically oval in cross section.

*G. corticata* var. *ramalinoides* J. Ag. In this variety the branching is irregular with short spine-like upper branches. Parts at least are markedly compressed.

*Hypnea boergesenii* Tanaka. This species differs from *H. valentiae* in that the ultimate lateral branches are both more abundant, and uniformly shorter and often bifurcate. The main axes are thicker and have a dense cover of short branches from the base upwards (Dawson, 1954, Fig. 46k).

At Gazi to seaward of Mangrove, *H. boergesenii* was found epiphytic on *Halodule wrightii.*

*H. nidulans* Setchell. A common cushion forming species.

**Ceramiales**

*Acrocystis nana* Zanard. Large numbers of plants bearing the characteristic small nipple shaped tetrasporic stichidia were found in December 1967 at Malindi and at Diani. These stichidia are mostly borne towards the upper end of the hollow obovate to pyriform determinate branches.

Plants of this species occur in small clumps at, and somewhat below, neap tide high water levels and also in large, dense and compact masses (see Okamura, 1907–09, Pl. 6, Fig. 1) on shaded vertical surfaces high up the shore.

It is probable that at least many of the Kenya plants previously identified as *Botryocladia chiajeana* (Meneghini) Kylin are sterile plants of *Acrocystis nana*. Material from Dar es Salaam was identified by Gerloff as *Botryocladia chiajeana* although this species was previously recorded only for the Mediterranean area and Teneriffe (Gerloff, 1957). Possibly this identification needs to be reconsidered.

*Bostrychia binderi* Harv. A very widely distributed species on the Kenya coast both on cliffs and overhangs to landward of coral reefs and in Mangroves on parts of trees uncovered by the falling tide.

*Chondria dasyphylla* (Woodw.) Ag.

*Herposiphonia tenella* (C. Ag.) Ambronn. A few plants of this minute species were found epiphytic on Melobesieae at Diani.

*Tolypiocladia calodictyon* (Harv.) Silva.

*T. glomerulata* (C. Ag.) Schmitz. This small alga was collected from the surface of larger algae over which it creeps. (Outer Reef, Diani).

The species of *Tolypiocladia* are sometimes found under *Rochera* but this name has been shown by Silva to be illegitimate (Silva, 1952).

*Vidalia fimbriata* (R. Br.) J. Ag. There is an earlier record from Dar es Salaam under the name of *V. melvilli* J. Ag. (See Boergesen, 1945, p. 44; also Boergesen, 1957, Fig. 4).

This is a variable species and the material collected on the Kenya coast shows a fair range of variation including plants agreeing with Fig. 20, Boergesen, 1945; and a small amount of material showing small branchlets arising from the flat surface of the thallus as well as from the margins. (See Boergesen, Pl. 4, 1957).

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